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Building classroom and school cultures of thinking is one of the fundamental and critical purposes of education. This study is an exploratory effort to obtain a clearer picture of teachers' perceptions about eight components of a culture of thinking within their own classroom. The instrument used is a quantitative survey developed by Ritchhart (2015) that examines eight forces of cultures of thinking (expectations, language, modeling, time, opportunities, routines, physical environment and interactions). The survey results provide useful information about potential target areas for those seeking to deepen cultures of thinking in educational settings.

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Building classroom and school cultures of thinking is one of the fundamental and critical purposes of education. This study is an exploratory effort to obtain a clearer picture of teachers' perceptions about eight components of a culture of thinking within their own classroom. The instrument used is a quantitative survey developed by Ritchhart (2015) that examines eight forces of cultures of thinking (expectations, language, modeling, time, opportunities, routines, physical environment and interactions). The survey results provide useful information about potential target areas for those seeking to deepen cultures of thinking in educational settings.

Introduction/Background

Schools and classrooms, like other human forms of organization are cultural entities exhibiting underlying values and beliefs, norms or shared values, and observable artifacts (Schein, 1992). A culture exhibits a system of language or symbol patterns that emerge from its beliefs and values. Like an iceberg, there are large underlying implicit features that support the explicit and observable features at the top. Therefore, any investigation of school culture is a complex task with many facets to explore. Cultures also exhibit multiple levels (individual, group, organizational, national, global) that interact with each other from both the bottom up and the top down (Erez & Gati, 2004). In the school setting, these cultural levels include individuals, the classroom, the school, the district, the community, the state and the nation). The focus of this study is on teachers support of a classroom culture of thinking as articulated by Ritchhart (2015).

[TABLE of CONTENTS](#)

To understand the implications of cultures of thinking one only needs to examine the daily news headlines or social media feeds filled with fake news, unsubstantiated claims and argumentation, echo chambers, use of stereotypes, disrespectful communications and personal attacks instead of thoughtful and productive dialog. In schools, over two decades of high-stakes state testing and 15 years of federally supported efforts narrowed the curriculum and resulted in efficient but shallow measurements of thinking. Recent efforts by the State of Kansas (KSDE, 2017) to broaden this narrow focus are a welcome relief to schools and teachers, yet they still present a significant challenge considering organizational and cultural habits developed over decades. Costa and Kallick (2009) articulated the better habits of mind and thought congruent with a culture of thinking. Employers also call for 21st century skills needed to supply a rapidly changing workforce with thoughtful, flexible, thinkers and communicators (Jacobs, 2010; Clemmitt, 2015; Hart Research Associates, 2015). Teaching thinking skills alone in isolation will not be enough to meet such challenges. Instead, it will require large educational shifts toward complex cognitive apprenticeships containing rich social and physical supports (Ritchhart & Perkins, 2005) . To effect such substantive change in culture of thinking in schools it will take a sustained, long-term focus on building such cultures in classrooms, schools and districts.

Ritchhart (2015) offers a valuable conceptual framework to focus efforts on school culture, articulating eight forces that shape cultures of thinking. These forces include:

Expectations - Expectations for students that focus on deep understanding instead of gaining knowledge, learning as opposed to just doing the work, independence instead of dependence, and metacognition and a growth mindset instead of a fixed mindset.

Language - Use of the specific language of thinking to notice, name, highlight and provide specific feedback on the kinds of individual and communal thinking we want.

Time - Managing and investing time in such manner that students have opportunities to deeply consider, to process, to discuss. to take stock of learning and to see the priorities on learning.

Modeling – Providing authentic teacher models of creative and analytical thinking, risk taking, reflection and positive dispositions.

Opportunities – Replacing a focus on doing “work for the teacher” with powerful opportunities for students to acquire new understandings, challenge misconceptions, consider evidence and different perspectives, apply new skills in novel contexts and create authentic products.

Routines – Establish a variety of learning and thinking routines that offer patterns of support and practice for students in group and individual thinking (Ritchhart, Church, Morrison, 2011).

Interactions – Foster respectful and thoughtful norms for student to student and student to teacher interactions based on listening, questioning, productive discourse and dialog.

Environment – Arrange physical space, time and materials to facilitate thinking, dialog, engagement and to reveal and capture records of thinking.

Teachers are described as the primary managers of culture in their own classrooms (Gruenert, 2015; Hattie, 2012) and as such their perceptions are a critical piece to understanding and changing such culture. The survey administered in this study explores teachers own perceptions about the likelihood of a visitor to observe artifacts relevant to each of these eight forces within their own classroom.

Methods

This study utilized, with permission, a modified survey developed originally by Ritchhart (2015, p.323). The survey, consisting of 40 Likert-scale items addressing eight forces of cultures of thinking, was sent

electronically to 1,533 K-12 teachers enrolled in a university's graduate school programs. The content and face validity of the survey was examined by 4 expert teacher educators (College of Education professors), and minor edits were employed. Five items were presented for each of the eight dimensional forces. Participants were asked to rate the likelihood of a visitor observing characteristics representing the eight forces of cultures of thinking (Ritchhart, 2015) with a 5-point scale as follows:

1. I doubt anyone would notice
2. Not very likely to notice
3. Hit or miss depending on the circumstances
4. Highly likely to notice
5. Hard to miss it

The items were organized, labeled, and presented to participants within in the eight categories of forces (1. Expectations supporting a culture of thinking, 2. Language supporting a culture of thinking, 3. Modeling supporting a culture of thinking, 4. Time supporting a culture of thinking, 5. Opportunities supporting a culture of thinking, 6. Routines supporting a culture of thinking, 7. Physical environment supporting a culture of thinking and 8. Interactions supporting a culture of thinking. Each item was worded so respondents would consider how often the described feature was observable in their classroom. The full text of the item wording along with its identifier code organized by category is found at the end of this article in Appendix A.

Descriptive statistics were compiled and analyzed using SPSS for the demographics and the Likert scale items.

Results

Two hundred and twelve surveys were returned in a completed state for a net return rate of 13.8%. Respondents were mostly mid-career teachers (3-20 years of teaching experience) from rural and small town contexts (55.9%). Sixty one percent of the respondents were teaching in a secondary

[TABLE of CONTENTS](#)

school (grades 6-12). The major content areas reported as their primary teaching responsibilities were Special Education (21.6%), Elementary teaching all subjects (17.4%), English Language Arts (8.9%), Mathematics (6.6%), and Science (6.6%). Fifty nine percent of the respondents reported that they were either somewhat or very familiar with Cultures of Thinking.

School Location/Context	N	%
Large City >100000	31	14.6%
Suburban near Urban Area	21	9.9%
Large Town > 25000	42	19.7%
Small Town <25000	57	26.8%
Rural <2500	62	29.1%
Total	213	100.0%

Table 1: Respondent School Location/Context

Years Experience	N	%
Not Reported	1	0.4%
1-2 yrs	39	18.3%
3-5 yrs	56	26.3%
6-10 yrs	40	18.8%
11-20 yrs	57	26.8%
21 or more yrs	20	9.4%
Total	213	100.0%

Table 2: Respondent Years of Teaching Experience

Level of Teaching	N	%
Pre-K	3	1.4%
Early Elem K-3	47	22.1%
Intermediate Elem 4-5	30	14.1%
Middle Level 6-8	35	16.4%
High School 9-12	96	45.1%
Missing	2	0.9%
Total	213	100.0%

Table 3: Respondent Teaching Level

Familiarity with CoT	N	%
Very familiar	17	8.0%
Somewhat Familiar	109	51.2%
Somewhat Unfamiliar	55	25.8%
Very Unfamiliar	30	14.1%
Missing	2	0.9%
Total	213	100.0%

Table 4: Familiarity with Cultures of Thinking

Primary Content Area Taught	N	%
Special Education	46	21.6%
Elementary (All Subjects)	37	17.4%
English Language Arts	19	8.9%
Mathematics	14	6.6%
Science	14	6.6%
Business	13	6.1%
Social Science	10	4.7%
Fine Arts	8	3.8%
Foreign Language	7	3.3%
Other (enter content area)	6	2.8%
Physical Education	6	2.8%
ROTC	6	2.8%
Technology / Industrial Arts / CTE	6	2.8%
Agriculture	5	2.3%
Family and Consumer Sci.	5	2.3%
Reading / Literacy	4	1.9%
English Language Learners (ESOL)	3	1.4%
Library	2	0.9%
Music	1	0.5%
Unreported	1	0.5%
Total	213	100.0%

Table 5: Respondent Primary Teaching Assignment

Expectations of a Culture of Thinking

Respondents reported positively (mean, median, mode >4) that characteristics representing expectations of thinking were observable in their classrooms with one exception, item E3 This statement included “thinking and learning are the outcomes of our class activity as opposed to completion of work” and received a mean of 3.80 indicating a weaker response.

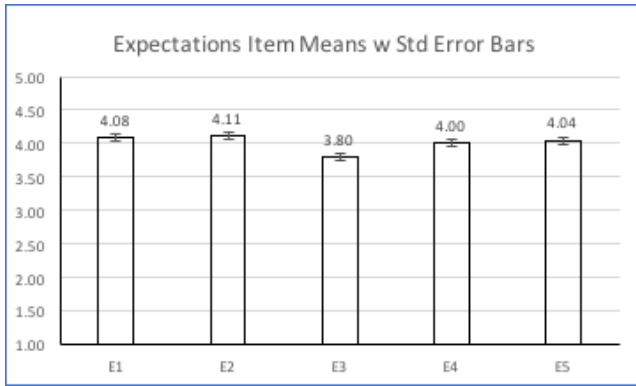


Figure 1: Mean Response for Expectation Items

Item	E1	E2	E3	E4	E5
N	212	212	212	212	211
Mean	4.08	4.11	3.80	4.00	4.04
Std Dev	0.78	0.87	0.82	0.72	0.83
Std Err	0.054	0.060	0.056	0.049	0.057
Median	4.00	4.00	4.00	4.00	4.00
Mode	4.00	4.00	4.00	4.00	4.00

Table 6: Descriptive Data for Expectation Items

Language of a Culture of Thinking

Four out of the five language items reported means below a four as well as reporting medians and modes of three on two items: (L2 concerning specific vs generic praise; and L4 concerning noticing and naming thinking occurring in the classroom). Item L4 reported the lowest mean of all items on the survey (mean = 3.05) Teachers reported much less confidence that the language of thinking was readily observable and explicit in their classrooms.

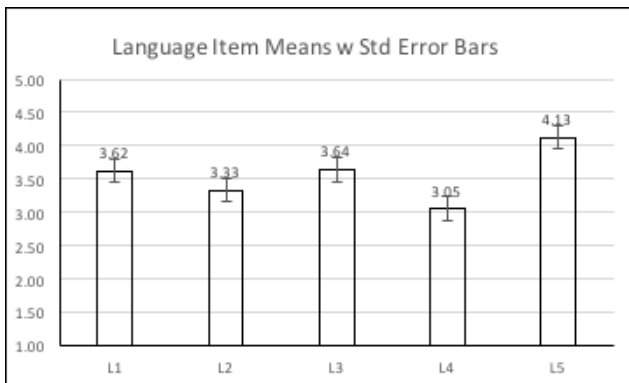


Figure 2: Mean Response for Language Items

Item	L1	L2	L3	L4	L5
N	212	212	211	212	212
Mean	3.62	3.33	3.64	3.05	4.13
Std Dev	0.90	0.87	0.86	1.01	0.84
Std Err	0.062	0.060	0.059	0.069	0.058
Median	4.00	3.00	4.00	3.00	4.00
Mode	4.00	3.00	4.00	3.00	4.00

Table 7: Descriptive Data for Language Items

Modeling a Culture of Thinking

Two of five items in the modeling section reported means lower than four. Modeling thinking of teachers and students through displays (M1) and having students model thinking by justifying and providing evidence for their thinking reported means of 3.96 and 3.54 respectively.

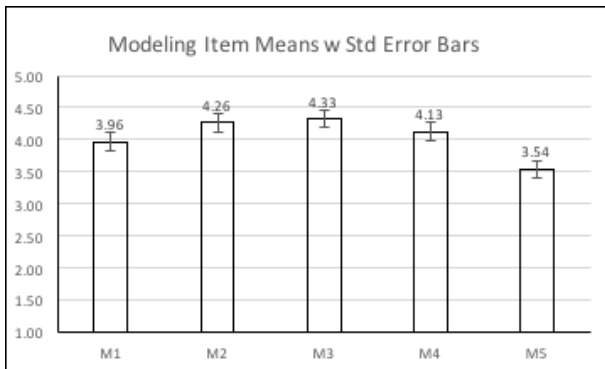


Figure 3: Mean Response for Modeling Items

Item	M1	M2	M3	M4	M5
N	211	212	212	212	212
Mean	3.96	4.26	4.33	4.13	3.54
Std Dev	0.74	0.75	0.66	0.80	0.83
Std Err	0.051	0.051	0.045	0.055	0.057
Median	4.00	4.00	4.00	4.00	4.00
Mode	4.00	4.00	4.00	4.00	4.00

Table 8: Descriptive Data for Modeling Items

Time for a Culture of Thinking

Four of the five items concerning making time for a culture of thinking reported means below a four.

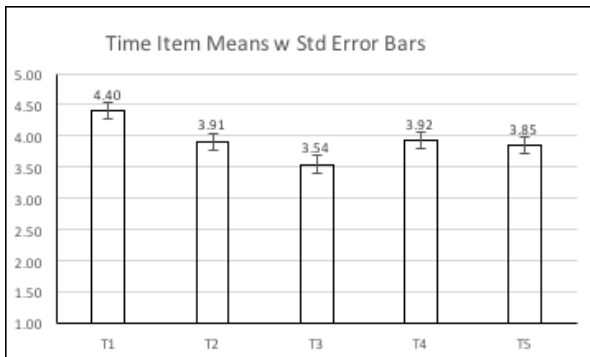


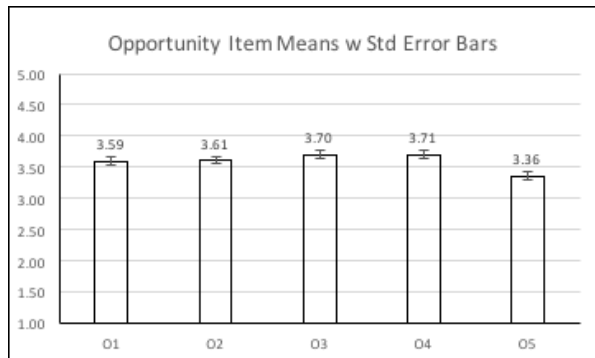
Figure 4: Mean Response for Time Items

Item	T1	T2	T3	T4	T5
N	211	212	212	211	212
Mean	4.40	3.91	3.54	3.92	3.85
Std Dev	0.69	0.89	0.90	0.76	0.86
Std Err	0.047	0.061	0.062	0.052	0.059
Median	5.00	4.00	4.00	4.00	4.00
Mode	5.00	4.00	3.00	4.00	4.00

Table 9: Descriptive Data for Time Items

Opportunities for a Culture of Thinking

All five item means related to opportunities supporting a culture of thinking scored below a four. In particular, item O5 concerning “opportunities to reflect on how one’s thinking about a topic has changed and developed over time” reported a mean of 3.36 and a median of three.



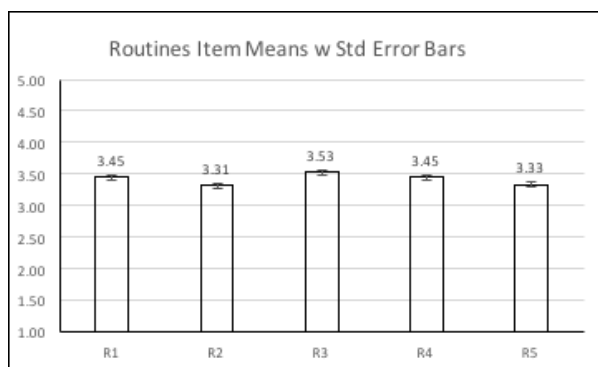
Item	O1	O2	O3	O4	O5
N	211	212	212	211	212
Mean	3.59	3.61	3.70	3.71	3.36
Std Dev	0.79	0.99	0.94	0.84	0.99
Std Err	0.054	0.068	0.064	0.058	0.068
Median	4.00	4.00	4.00	4.00	3.00
Mode	3.00	4.00	4.00	4.00	4.00

Figure 5: Mean Response for Opportunity Items

Table 10: Descriptive Data for Opportunity Items

Routines for a Culture of Thinking

All five item means related to the use of thinking routines reported means below a four and four of the five reported means below 3.5. The lowest scoring items R2 (mean = 3.31) and R5 (mean =3.33) focused on using routines flexibly, spontaneously, and effectively to deepen students’ understanding and using them to deepen understanding rather than as assignments to be completed.



Item	R1	R2	R3	R4	R5
N	212	212	212	212	212
Mean	3.45	3.31	3.53	3.45	3.33
Std Dev	0.96	0.91	0.87	0.95	0.88
Std Err	0.066	0.062	0.060	0.065	0.060
Median	3.00	3.00	4.00	3.00	3.00
Mode	3.00	3.00	4.00	3.00	3.00

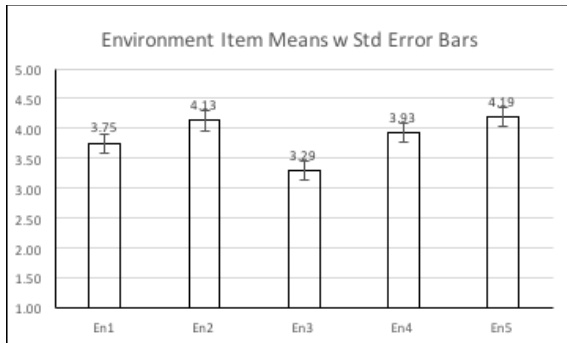
Figure 6: Mean Response for Routines Items

Table 11: Descriptive Data for Routines Items

Physical Environment for a Culture of Thinking

[TABLE of CONTENTS](#)

Three of the five items regarding the physical environment supporting a culture of thinking (En1, En3 and En4) reported means less than four. These items focused on the use of positive displays about thinking (En1), displays of how student thinking has changed over time (En3) and capturing student thinking using technology and other methods (En4). Item En3 also reported a median and mode of three.



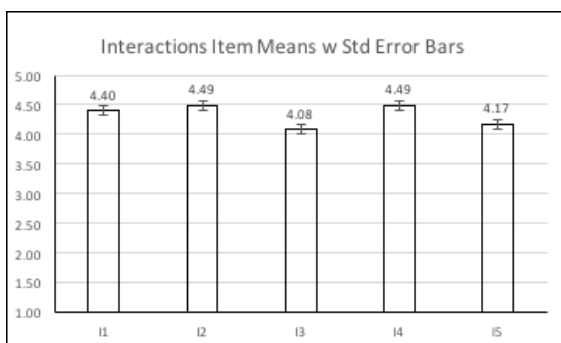
Item	En1	En2	En3	En4	En5
N	212	213	213	213	212
Mean	3.75	4.13	3.29	3.93	4.19
Std Dev	1.05	0.97	1.22	0.93	0.80
Std Err	0.072	0.067	0.084	0.064	0.055
Median	4.00	4.00	3.00	4.00	4.00
Mode	4.00	5.00	3.00	4.00	4.00

Figure 7: Mean Response to Environment Items

Table 12: Descriptive Data for Environment Items

Interactions for a Culture of Thinking

All five items representing interactions reported means, medians and modes greater than four and represented the cultural force with the highest scores.



Item	I1	I2	I3	I4	I5
N	213	213	212	213	212
Mean	4.40	4.49	4.08	4.49	4.17
Std Dev	0.68	0.63	0.82	0.59	0.83
Std Err	0.047	0.043	0.056	0.040	0.057
Median	4.00	5.00	4.00	5.00	4.00
Mode	5.00	5.00	4.00	5.00	4.00

Figure 8: Mean Response to Interactions Items

Table 13: Descriptive Data for Interactions Items

Discussion and Implications

This exploratory study indicates that teachers believe they are generally addressing cultures of thinking within their classrooms. However, when asked if there is specific evidence of that, they were considerably less confident. This raises question about teachers over-estimating the quality and quantity of the presence of the eight features of cultures of thinking within their own classroom. It may raise questions about teachers' depth of focus on several of the features of cultures of thinking including expectations, language, modeling, opportunities, routines and physical environment. Examination of the descriptive statistics from this study has revealed patterns that are ripe for future investigation through classroom observations, case studies and further school stakeholder interviews. The specific areas that were revealed by this study requiring a closer look are as follows:

- Establishing thinking and learning as goals for the classroom vs. the completion of work.
- Shifting from use of generic praise to specific feedback.
- Consistently naming and using terms for thinking that is desired in classrooms.
- Using models of thinking in displays and promoting student modeling of their thinking.
- Providing space and time for thinking in the classroom culture, especially with a focus on providing processing time for thinking.
- Insuring that the teacher does not dominate thinking but invites and promotes student thinking.
- Making the use of thinking routines, especially by students as a routine occurrence in the classroom.
- Moving toward displays are dialogic, iterative and focused on displaying the growth of student thinking rather than static displays of achievement.

Many of these areas of concern are not the “low hanging fruit” of classroom change. They will require extensive practice and commitment to effect significant change. They may also require the support of leadership with a similar vision for a culture of thinking.

Respondents in this study also reported areas of strength that would benefit from confirmation and validation. Those areas of possible strength self-reported by the teachers were:

- Making time for student questions and contributions
- Arranging the space of the classroom to facilitate thoughtful interactions, collaborations, and discussions

- Promoting respect of students for each other's thinking
- Making it clear that mistakes are acceptable and encouraged as a necessary part of the thinking and learning process
- Teachers being curious about and valuing student thinking
- Teachers establishment of positive classroom interactions supporting a culture of thinking

It is acknowledged that this study is self-reported and that the perceptions of teachers might not always accurately represent the distribution of actions and characteristics present in their classrooms. It is important that confirmatory data be obtained from other school stakeholders (students, parents, and administrators). This study is viewed as an exploratory study to be followed with classroom walkthroughs, case studies and interviews with other stakeholders in school-based cultures of thinking. It is also acknowledged that because these data were collected from teachers who are also students enrolled in graduate school they may not represent a cross section of teachers. For example, special education teachers participating in the survey (21%) exceeded their representation in the general United States teacher population (approximately 7.1%) (NCES, 2015).

In summary, this study provides a basis for the work to be done in creating cultural shifts towards deepening teacher support of thinking in classrooms and schools. It provides a starting point for conversations about cultures of thinking and identification of professional development needs within schools.

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[TABLE of CONTENTS](#)

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[TABLE of CONTENTS](#)

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Appendix A - Quantitative Items from the Culture of Thinking Self- Assessment Instrument

Expectations Supporting a Culture of Thinking:

- E1- I make a conscious effort to communicate to students that my classroom is a place in which thinking is valued.
- E2 - I establish a set of expectations for learning and thinking with my students in a similar way that I establish behavioral expectations.
- E3 - I stress that thinking and learning are the outcomes of our class activity as opposed to "completion of work".
- E4 - "Developing understanding" is the goal of classroom activity and lessons versus knowledge acquisition only.
- E5 - Student independence is being actively cultivated so that students are not dependent on the teacher to answer all questions and direct all activity.

Language Supporting a Culture of Thinking:

- L1 - I make a conscious effort to use the language of thinking in my teaching discussing with students the sort of thinking moves required by verbs such as 'elaborate', 'evaluate', 'justify', 'contrast', 'explain' etc.
- L2 - I seldom use generic praise comments (good job, great, brilliant, well done) and instead give specific, targeted, action-oriented feedback that focuses on guiding future efforts and actions.
- L3 - I use "conditional" phrases such as 'could be', 'might be', 'one possibility is', 'some people think' or 'usually it is that way but not always'.
- L4 - I try to notice and name the thinking occurring in my classroom. For example, might I be heard to say things like, "Sean is supporting his ideas with evidence here", or "Sam is evaluating the effectiveness of that strategy right now", or "Iris has presented an interesting analogy today".
- L5 - I use inclusive, community-building language by talking about what "we" are learning or "our" questions.

Modeling Supporting a Culture of Thinking:

- M1 - Thinking is regularly on display (my own as well as students) in the classroom.
- M2 - I demonstrate my own curiosity, passion, and interest to students.
- M3 - I display open- mindedness and a willingness to consider alternative perspectives.
- M4 - It is clear that I am learning too, taking risks, and reflecting on my learning.
- M5 - Students model their thought process by spontaneously justifying and providing evidence for their thinking.

Time Supporting a Culture of Thinking:

- T1 - I make time for students' questions and contributions.
- T2 - I provide the "space" for students to extend, elaborate, or develop the ideas of others.
- T3 - I avoid disseminating an abundance of ideas without the time to process them.
- T4 - I give students time to think and develop ideas before asking for contributions.
- T5 - I monitor the amount of time I talk so as not to dominate the classroom conversation.

Opportunities Supporting a Culture of Thinking:

- O1 - I ensure that rich thinking opportunities are woven into the fabric of my teaching and students aren't just engaged in work or activity.

[TABLE of CONTENTS](#)

- O2 - I focus students' attention on big subject matter issues, important ideas in the world, and in meaningful connections within my discipline and beyond.
- O3 - I provide students with opportunities for students to direct their own learning and become independent learners.
- O4 - I take pains to select content and stimuli for class consideration in order to provoke thinking.
- O5 - I provide opportunities to reflect on how one's thinking about a topic has changed and developed over time.

Routines Supporting a Culture of Thinking:

- R1 - I use thinking routines and structures to help students organize their thinking.
- R2 - I use thinking routines flexibly, spontaneously, and effectively to deepen students' understanding.
- R3 - I am good at matching a routine with appropriate content so that students are able to achieve a deeper level of understanding.
- R4 - Have thinking routines become patterns of behavior in my classroom; that is, do students know particular routines so well that they no longer seek clarification about the mechanics of the routine, instead going straight to the thinking.
- R5 - Students' use routines and structures to further their understanding and as a platform for discussion, rather than as work to be done.

Physical Environment Supporting a Culture of Thinking:

- En1 - Displays in the room inspire learning in the subject area and connect students to the larger world of ideas by displaying positive messages about learning and thinking.
- En2 - I arrange the space of my classroom to facilitate thoughtful interactions, collaborations, and discussions.
- En3 - My wall displays have an ongoing, iterative, and/or dialogic nature to them versus only static display of finished work.
- En4 - I use a variety of ways to document and capture thinking, including technology.
- En5 - A visitor would be able to discern what I care about and value when it comes to learning.

Interactions Supporting a Culture of Thinking:

- I1 - I ensure that all students respect each other's thinking in my classroom. Ideas may be critiqued or challenged but people are not.
- I2 - I make it clear that mistakes are acceptable and encouraged within my classroom.
- I3 - Students are pushed to elaborate their responses, to reason, and to think beyond a simple answer or statement? For example, by using the "What makes you say that?" routine.
- I4 - I listen to students and show a genuine curiosity and interest in students' thinking. It is clear I value their thinking.
- I5 - I listen in on groups and allow them to act independently rather than always inserting myself into the process.